MARINE REVIEW.

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The Tariff on Iron Ore.

Although it is announced from Washington that the ways and means committee of the House refused to consider even the claims of Democratic Alabama and other southern states for a continuance of some measure of protection to the iron ore industry, it is more than probable that the opposition to putting ore on the free list will be carried to the floor of the House, and when the bill comes up the representatives of southern iron manufacturing states will find that the iron ore producers and vessel owners of the lake region have enlisted some support from their Democratic brethern in lake states. Congressmen Whiting and Weadock of Michigan are both hesitating about casting their votes against the main industry of the state which they represent, and in fact it is about certain that Mr. Whiting will favor a reduction in the duty but not in the removal of it. Protests now going to Washington from vessel owners in different lake cities will have a strengthening effect upon Democratic congressmen from the states bordering on the lakes, and if the legislative committee of the Lake Carriers' Asssociation, which will meet at Buffalo Monday, decides to give expression to the general sentiment among the vessel owners, more gratifying results may be expected.

Northern Line Passenger Ships.

When the first of the Northern Steamship Company's twin-screw passenger ships is launched by the Globe Iron Works Company it will probably be nearer completion than any big steel ship ever launched in this country. This is due largely to conditions that have bunched different parts of the work on the two boats. All of the cabin work on the first boat, as well as the boat on which work has been suspended, has been carried on while operations on hull and machinery were under way, and as a result the decorators are now about to begin on the first steamer, while the cabinet work on the second steamer is being stored, preparatory to being put up when the time comes for it. Further construction on the second steamer is thus delayed, it will be seen, simply for the reason that all has been done that can be done on that boat until such time as the owners are thoroughly satisfied regarding the first boat, and yet there are over 750 men employed in the ship yard. When the time arrives for a continuance of work on the second boat, and on similar ships which the owners still talk of building, there will certainly be a big saving of cost in construction from the plans and methods settled in the first boat, as has already been demonstrated in the work as far as it has gone.

A Scheme of Minimum Rates.

An editorial in the REVIEW of last week, which referred to a proposition from several prominent vessel owners to place the business fleet of the lakes under one management, has brought out another scheme, which was submitted to the officers of the Lake Carriers' Association last spring, but which was put aside, not on account of any impracticable features in it, but for the reason that the freight conditions then ruling were not such as to prompt the adoption of radical changes of any kind. The season now drawing to a close has, however, certainly paved the way for departures of an extreme kind in freight matters, and although the present agitation may again end in talk, it is about certain the question of adopting plans for the regulation of freights will be brought into the deliberations at the next annual meeting of the Lake Carriers' Association, and will have an important bearing upon the membership of the association. The scheme of minimum rates has been talked of more or less for a year past. One of its principal aims is to avoid antagonizing shippers, who could readily meet a pool among vessel owners with a counter combination. A schedule of fair minimum rates, below which owners would not load their vessels, would not meet with serious objection from shippers, and in fact might be expected to receive the approval of the latter, from the standpoint of uniformity in carrying charges. In considering the plan, take for instance the following schedule of minimum rates as an illustration:

On ore from ports at the head of Lake Superior to Lake Erie ports	$1.05
" " Escanaba and Gladstone " " "	75
" " Marquette " " "	95
On coal from Lake Erie ports to head of Lake Superior	50
" " " " " " " " Escanaba and Gladstone	45
" " " " " " " " Manitowoc	50
" " " " " " " " Milwaukee	55
" " " " " " " " Chicago	60

Minimum rates on grain to be equivalent to rates on ore.

These figures may be considered high or low by either shippers or owners, but they represent a range of freights that would certainly leave only a moderate margin of profit for a very large amount of tonnage engaged in the general carrying trade. The scheme has met mith more general approval from both owners and shippers than anything as yet suggested, and if the owners who favor it go to the annual meeting at Detroit with details well attended to they may be successful.

The Lakes are High Seas.

The supreme court of the United States has rendered a decision in the case of the United States as plaintiff, against Robert S. Rodgers, indicted under the act of Congress, providing for the punishment of offences committed on the high seas. Rodgers demurred to the jurisdiction of the United States court when brought to trial for an assault alleged to have been committed on a United States vessel in the Detroit river, and the circuit court of the United States, for the eastern district of Michigan, held that the great lakes were not comprehended within the term high seas. The United States supreme court holds that the decision of the lower court was erroneous, and in an opinion by Justice Field, said in effect that there has been an advance and development as respects the doctrine of high seas, and that as used in the act of Congress, it means waters over which no particular state has jurisdiction. In this opinion Justices Gray and Brown dissented in separate opinions.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Nov. 18, 1893:

	Wheat, bu.	Corn, bu.
Chicago	19,273,000	1,582,000
Duluth	7,783,000	.....
Milwaukee	843,000	.....
Detroit	1,338,000	6,000
Toledo	2,171,000	254,000
Buffalo	2,679,000	731,000
Total	33,987,000	2,573,000

At the points named there is a net increase for the week of 793,000 bushels of wheat and a net decrease of 379,000 bushels of corn

Facts About the United States Navy.

Secretary of the Navy Herbert became interested in the navy when a boy through reading "The Naval Battles of the Revolution and of 1812."

The fifth place in the navies of the world lies between the United States and Germany, England having first, France, Italy and Russia following.

During the first two years of the Revolution our improvised navy captured 267 British ships, and in the fourteen battles of the war of 1812 the American navy was victorious in ten and only defeated in two. At the beginning of the civil war the United States had 90 vessels and at its close there were 770.

Projectiles in use weigh 1,100 pounds and the 13-inch guns to fire them are 40 feet long, weigh 60 tons each and require 550 pounds of powder for a charge. The projectile goes 13 miles at the rate of 2,100 feet per second. If that velocity were continued the projectile would cross the Atlantic in two hours and a half and go around the world in less than a day.

A knot is a nautical mile, and its length is fixed by the United States Hydrographic Office and Coast Survey at 6,080.27 feet and by the English admiralty at 6,080 feet. The land mile in England and the United States is 5,280 feet. When the Columbia was cutting through the water at a 22⅞ knot-gait she was travelling rather more than 26½ miles an hour, which is a higher speed than that of most local express trains. Nov. 14, 1883, there was not an American man-of-war in commission that could steam 16 miles an hour, and the building of the new navy having just begun, the nation was thinking that 16½-knot speed, expected of the Atlanta, would be a record that would encourage our shipbuilders to strive for higher speed.

Trolley Boats on the Erie Canal.

Nearly two years ago a young electrical engineer of Buffalo suggested to the MARINE REVIEW that the canal boats on the Erie canal could be run very economically by electricity, applied by the trolley system used on street railways. The article in the REVIEW was copied widely, and the New York Sun printed a special article on the subject. Mr. Willis Adams, the electrical engineer, consulted with several Buffalo capitalists and was encouraged to submit plans. Shortly after, he removed to Chicago and other business prevented anything being done with his suggestion. It was taken up by other parties, however, and an appropriation was made by the state for a test. The result was that last week the first canal boat in the world to be run by electricity went over a level near Rochester, N. Y., at from four to seven miles an hour, and had a towing capacity sufficient to handle five or six boats more. Gov. Flower, Nicola Tesla, the electrical expert, representatives of the New York produce exchange, Superintendent of Works Hannan and others were present. The governor remarked that if power could be obtained from Niagara at 50 cents a day as suggested, it would result in grain being carried from Buffalo to New York at two and one-half cents a bushel, and the lake rate of two and one-half cents would make the total cost of taking wheat from the fields to New York for five cents a bushel. He added that that would beat the Mississippi, Canadian or any other route.

Further Particulars of Duluth's Ore Docks.

A very good illustration of the new Duluth, Missabe & Northern ore docks was presented in the preceding issue of the REVIEW, and a correspondent furnishes this week some additional particulars which are given herewith: The dock is 2,340 feet long, 52 feet wide and 53 feet high and has 384 pockets of 45 degrees angle and a storage capacity of 150 tons each. In the structure there were used 8,000 piles including the fenders and 10,300,000 feet of timber. The chutes, built by the American Steel Barge Company, are 26 feet 2 inches long and 3 feet 2 inches wide, with a curve of a half circle. They are hung 28 feet above the water and are capable of being lowered 70 degrees, being operated by the latest improved counter-balance hoist. There are six working tracks and the dock is lit by 25 electric lights, of 2,000 candle power each. The first pile was driven Jan. 20, 1893, the first ore received July 22, and the first shipment was made on the steamer H. W. Sibley July 31. Using but 200 pockets the shipments to date are 392,144 tons and will without doubt reach 425.000 tons this season. It is a common occurance to load a boat of 2,000 tons capacity in one hour and thirty minutes. In fact this is so common that nothing is thought of having a boat arrive, load and depart inside of two hours. There is no question but that it is the handsomest, largest and quickest working dock on the lakes. It was built under the supervision of Capt. G. J. Anderson and cost complete $425,000. The approach is 4,000 feet long and was built by A. and D. Saug.

Circulation, Readers, Buyers.

One of our contemporaries tells a story that has a large hint embodied in it. A prominent manufacturer was asked why he did not send out circulars instead of advertising in the trade and technical journals. His answer was that he sold his goods to people who read the journals, and sent circulars to those who did not, and for that reason the latter did but little good. This is true in most lines of skilled manufacture, but it admits of a farther qualification, namely, that the best place to advertise is in journals that are read. A great circulation can sometimes be attained without readers. The REVIEW would go farther and classify the readers. A circulation among those who are not in position to buy the goods advertised is of little benefit to advertisers. The REVIEW'S subscription list is open to show advertisers that it reaches those who buy material and supplies for the lake marine trade. There are several reasons why this is true of the REVIEW especially.

A Sub-Marine Boat from Oshkosh.

As the result of eight years experimental work the Northwestern claims that Richard Raddatz of Oshkosh, Wis., has perfected a successful sub-marine boat. It is very similar to the Baker boat built in Detroit several years ago and rejected by the secretary of the navy recently as being unpractical for naval purposes. The inventor of the Oshkosh boat does not seek government aid but experts to use it for wrecking purposes, a Detroit wrecking company, it is said, having made him a proposition to locate a valuable wreck at the bottom of Lake Huron. The shell is 50 feet long, 4 feet wide and 7½ feet high. It is of steel and said to be strong enough to withstand pressure at a depth of 500 feet, a statement that is discreditable to some more reasonable claims. In perfecting the air circulation a machine has been invented which at a cost of $2 a day will keep the air in a merchant ship wholesome. The description states that the ship is lowered and raised by hydraulic machinery but none of the details are given.

Not Favorable to Paternalism.

Alike to most representatives of merchant shipping of this country, German vessel owners do not take kindly to government paternalism in the conduct of shipping affairs. The German Nautical Association recently adopted the following resolution: "A government supervision of German ship building and German shipping interests, and the Nautical Association of Hamburg emphatically protest against it, there being no necessity for such interference, a quite sufficient supervision being already exercised by the association for the classification of ships, the insurance companies, the emigration inspectors, the marine associations, boiler inspectors, etc., etc."

Evolution in Side Wheel Steamers.

As an example of the evolution of marine architecture and engineering the following particulars of the fleet of Long Island sound steamers owned by the Fall River line are given. This advance has been made within three decades. By comparing the power relative to tonnage it will be seen that where a horse power per registered ton was sufficient a short time since, now nearly two horse power is required to drive a registered ton through the water at the desired speed. These boats have been described from time to time in the REVIEW and a repetition is not necessary.

STEAMER.	Length over all.	Length on water line.	Breadth over guards.	Breadth of hull.	Depth of hull, moulded.	Draft of water.	Horse power of engines.	Registered tonnage.
	feet.	feet.	feet.	feet.	feet.	feet.		
New steamer	440	424	93	52½	21½	12½	8,500	.....
Puritan	419⅓	403⅓	91	52	21⅓	11⅔	7,500	4,593
Pilgrim	390	375	91	50	18½	11⅔	5,390	3,484
Plymouth	366	351⅔	87	50	21⅔	11	5,300	3,779
Providence	373	363	84½	47½	17¼	9⅔	2,900	2,962
City of Taunton	300	285	73	42½	18¾	10	2,800	2,882
City of Brockton	287	272	75	42⅓	18⅔	9½	2,250	2,771
City of Fall River	273	260	73	42⅓	18¼	9¼	2,000	2,553
City of New Bedford / City of Fitchburg	197	192	.....	32	13	11	600	820

After the Fair.

Now that the World's Columbian Exposition is over and business is beginning to settle down to its normal condition, the question arises, has it paid? That is, have exhibitors received an adequate return for the time and money invested in preparing and caring for their exhibits during the six months of the life of the fair. In the sense of receiving a direct financial return for the investment in the way of increased orders, we do not think there are many exhibitors who have been paid, but there are many other ways in which the returns have been satisfactory. Exhibitors have been able to meet their customers from all parts of the country and all parts of the world and to become personally acquainted and find out their opinions and get their suggestions regarding their goods. This has been noticeably true with reference to exhibits of specialties, which are handled by large firms in all parts of the world, and where each traveling man sent out by the house covers very much territory and sees part of his trade sometimes only once a year or so. An example of this is seen in the case of the Penberthy Injector Company, manufacturers of the celebrated Penberthy injector and many other specialties in steam brass goods, who had a very fine exhibit in machinery hall. They report that during the fair, they received calls from nearly all their extensive trade and from representatives of many firms handling their injectors, with whom they had never before been acquainted, and while they expected to receive more or less complaints from parties who had trouble with the injector, owing to faulty connections or an imperfect understanding of how to operate the machine, very much to their surprise out of the vast number of visitors whom they entertained, only two were found who had any complaint whatever, and theirs were of a nature easily and satisfactorily explained. Their injector received not only the usual diploma awarded to all exhibitors, but a special mention for many points of merit, in which they excelled other machines, as shown by actual test.

Inventions of a Marine Nature.

Specially reported from the patent office, Washington, D. C., for the MARINE REVIEW.

508,383—Propeller, by Amherst P. Gordon of San Francisco, Cal.; filed Nov. 4, 1892.

508,400.—Signal buoy, by James Biggler of New Burg, N. Y.; filed Nov. 5, 1892.

508,670.—Ball thrust bearing, by Norman C. Bassett of Lynn, Mass.; filed July 18, 1892.

Copies of specifications accompanying these patents can be had at 15 cents each upon application to the MARINE REVIEW, 516 Perry-Payne building Cleveland, O.

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Year's Work of the Life Saving Service.

The following is an abstract of the report of the general superintendent of the life-saving service for the past year: At the close of the last fiscal year the establishment embraced 244 stations, 182 being on the Atlantic, forty-nine on the lakes, twelve on the Pacific and one at Louisville, Ky. The number of disasters to documented vessels within the field of the operation of the service during the year was 427. There were on board these vessels 3,565 persons, of whom 3,542 were saved and 23 lost; 663 shipwrecked persons received succor at the stations to whom 1,659 days' relief in the aggregrate was afforded. The estimated value of the vessels involved in the disasters was $6,414,075, and that of their cargoes $1,684,000, making a total value of property imperiled $8,098,075. Of this amount $6,442,505 was saved and $1,655,570 lost. The number of vessels totally lost was 88. In addition to the foregoing there were during the year 154 casualties to small craft, such as sail boats, row boats, etc., on which there were 327 persons, 321 of whom were saved and six lost. The property involved in these instances is estimated at $153,035, of which $128,345 was saved and $24,690 lost.

The extent of the assistance rendered in saving vessels and cargoes was greater than ever before, with the exception of a single year. The crews saved without outside assistance 173 vessels, valued with their cargoes at $1,014,635, and assisted other efforts in saving 116 vessels, valued with their cargoes at $2,375,500, making the aggregate number of vessels which they saved and assisted to save during the year 289, involving $3,390,135 of property. Assistance of minor importance was rendered to 215 other vessels, and 235 vessels were warned from danger by the signals of the patrolmen. The cost of the maintenance of the service during the year was $1,231,893 45.

The following is a summary of the statistics of the service from the introduction of the present system in 1871 to the close of the fiscal year: Number of disasters, 7,031; value of vessels, $77,905,420; total value of cargoes, $35,056,009; total value of property involved, $112,961,429; total value of property saved, $85,392,307; total value of property lost, $27,569,122; total number of persons involved, 56,818; total number of lives lost, 656; total number of persons succored, 10,563; total number of days' succor afforded, 27,647. New stations have been established and put in operation since the last annual report at Brant Rock, Mass., Fort Niagara, N. Y., and Kewaunee, Wis. A station is under construction at Ashtabula, O, and another on the coast of California south of the present Golden Gate Park station, as an additional protection to the entrance to San Francisco harbor.

Taxation of Vessel Property.

The Maratime Register of New York, referring to the recent effort of the Cleveland board of equalization to collect taxes from non-resident vessel owners who own part interests in vessels registered in Cleveland, makes a few good points in the following paragraph:

"The Cleveland authorities are evidently beyond their depth. The injustice of their plan does not of course appear to them. In this, however, they are no different from other communities where the ship seems to be considered only a thing to be taxed or robbed. It is forgotten, or not understood in Cleveland, that a vessel is registered at a custom house in order to comply with the national laws and to secure certain rights and privileges, and not for any protection or help that the town in which the custom house is situated may give. For this purpose only a very small interest in the vessel need be owned in the registration district. In fact this is very frequently the case. For all practical purposes every vessel registered in Cleveland could just as well be registered in the next adjoining district, and the whole absurd plan fall to the ground for want of the shallow pretext upon which it is now based. The chances, therefore, of enforcing this tax are not so great as that of having litigation over it, if its enforcement is attempted. Cleveland and every other place where vessel property is taxed would do well to abolish such taxes as being unjust, unfair and inimical to shipping. They are collected under false pretenses and are set up as payment for services not rendered and which it is impossible for municipal or local authorities to render. Vessel property is to all intents and purposes protected and helped by the national government only. It receives its rights and titles from that power, is regulated only by it, and receives no protection from the residence town of its owners which is not fully paid for by the local tax that owner pays, through his real estate, house rent, income tax, or in whatever shape it may be made.

Tips From the Man on the Dock.

Not long since I was on one of the Lehigh liners coming through the Straits. It was one of those evenings for which poets clap on all sail in their description but never get within hailing distance of them as they appear to the sailor. The black water, the blue sky, fading into gray, the stars above, the dim light of a vessel in the distance, increasing until a hull looms up with a big red or green eye, the thud of the engines, the wash of the water, and the moon scudding through the sky, were all features of the panorama. I was "helping" the mate up forward when the watchman reported a light on the starboard bow. The mate said "Some one coming!" "It will be a long time before you pass the boat carrying that light," said the captain. "Think so?" the mate mused to himself. "The old man thinks its a lighthouse. I don't know what this boat would come to if it weren't for me." We watched it carefully and on it seemed to come, brighter and nearer until we thought it was in range of the glasses. They showed the light but no hull.

The captain laughed at our surprise and said the occurrance reminded him of a story. "This is not my first experience with that light," he said. "A number of years ago when I sailed the Osceola about this time in the fall, one evening, we came abreast of Thunder bay island on our way up. In those days traders were important figures in Lake Superior business. The one that I had aboard was a fat fellow who had the habit of drawing his neck down into his collar like a turtle. We were standing on the deck and were speculating as to whether the St. Paul had cleared from Detroit soon after we did. The St. Paul and the Osceola could have beaten one another out of sight, but only one could race at a time. The trader knew that a competitor was coming up on the St. Paul and he was anxious, I confessed for the only time in my life that the St. Paul's light would probably show up astern pretty soon. And sure enough as he strained his eyes he discovered a light. He turned turtle and asked for the glasses. They would not work until the light came into proper position, but he couldn't see it with the glasses. He could see without the glasses that the light was growing brighter. He enlisted the sympathy of the engineer and the Osceola seemed to pull away for a moment. He knew his competitor used cigars to get business and he began to hand them out very freely. The Osceola's smoke got blacker and the effect was palpable when the trader came from below with a case of imported ale. The officers sat down to it, and each bottle was opened with a story of how he had scooped the other trader on previous occasions. Suddenly he jumped up and looked out astern. The light had disappeared. It was twinkling way up in the sky with the other stars, but he didn't wonder what it was. He simply mumbled—'One case ale and fifteen cigars——*——*'"

In the REVIEW of Nov. 9 I had something to say of whalebacks in general, and now I am taken to task for my heretical utterances by the "man off the dock." He evidently thinks I am posing as a whaleback champion. I beg to plead not guilty. So far as I have been able to see they need none. I only undertook to call attention to their misrepresentation. If they are such an undesirable craft it would hardly seem necesary to go to the trouble of blackening them. But I have noticed one thing in this connection, and that is that the father of the whaleback has never gone out of his way to attack the "regular pattern," but has gone on building whales and minding his own business. Because a man conceived an idea that a certain type of vessel would present some advantages over another type and had the faith in his invention to give it a practical test, I see no reason for anybody going to the trouble of misrepresenting him or his work. He stepped on nobody's toes but built the boats for himself and his associates and it was their funeral entirely.

I yield to no man in my admiration for a fine looking vessel, but fine feathers do not always make fine birds. The man off the dock is simply in the same position as the newspaper recently quoted. A boat looking a little less like a "pig" but embodying the leading features of its construction would probably draw forth his praises. And my reference to the attitude of the Detroit press was not intended to be underatood as being confined to whalebacks by any means. It extends to the work of others than McDougall. As to Detroit being the home of the metal shipbuilding industry, there is room for argument. There were metal boats on the lakes long before Detroit ever built one, and the "building of steel boats on a large scale" is in need of definition. No one has said anything against the work of Detroit yards, but misrepresenting the work of others will not better it any. Because Detroit builders have done well in a certain type of vessel, shall no one be permitted to build any other type? And even if we grant that it remains to be proved that the "pig" is any better than the "regular", it also remains to be proved that it is inferior. Nowadays it often happens that the man who ridicules a new thing loses himself a seat in the band wagon. I don't see why it follows that the "pigs" are "built without advantages derived from years of study, &c." It depends largely upon the definition of the word "study," and the experience of others is an open book. I heard of an experience of the Colgate on Lake Superior in October which I hardly think many of the "regulars" would shine in. Her cargo shifted and she lay almost on her beam ends for twenty-four hours in a gale that made the best of them "hunt their holes," even when in good trim. No wonder she wet some of her cargo. But probably being a "pig" she had no business to let her cargo shift. As for the wet grain or "brose" in the pigs, and the statement referring to their water bottoms, does the man off the dock pretend to say that all other builders test their water bottoms? I guess not. If he does, I recommend him to read his opening sentence: "Few men are acquainted with facts, etc."

Better not press that point too far. In conclusion I would say again that I only desire to see fair play. Give the "pig" a chance. It took ages to develop the "regular pattern" and a more radical departure than the whale can hardly be imagined. As for their beauty, I have heard that their inventor said that they carried more corn than poetry, and that aesthetic considerations entered into their construction not at all. Here is hoping that the man off the dock may climb out before he is swamped by a passing whale.

The editorial in last week's REVIEW concerning a pool or trust among vessel men put Capt. Erastus Day in a reminiscent strain. He came from near Ogdensburg and remembers when posters were pasted up in the small towns adjacent to the lake, stating that on a certain day the brig ——— would sail with passengers and freight to Chicago. The hold was partitioned off into berths and good fares usually made the trip profitable. There were no paved streets in Chicago then, and Fort Dearborn was still standing. The grain rate from Chicago to Buffalo was as high as 25 cents, and vessels laid in Chicago from three to four weeks before they would accept 7 cents a bushel. Of course there were no elevators in those days, and the cargoes, which ranged from 8,000 to 9,000 bushels, were unloaded by being bagged and hoisted from the hold by a sailor, a rope and a pulley block. Then the bags were shouldered and carried into the mills. Brigs usually carried from eight to ten men before the mast, and they were paid $15 a month. No doubt they earned it, for Capt. Day mentions an instance of getting a cargo of grain in Cleveland when the sailors had to carry the bags from the farmers' wagons and empty them into the hold. But they had improvements thirty years ago as well as now, and the old style of bagging and hoisting was superseded for a time by forming a line of men and passing the grain in buckets, something like water is passed during fires in small villages. A delay of a week at Bar point, Lake Erie, waiting for a wind to get up the rivers was nothing unusual. The trust among vessel owners which was formed sometime about 1867 was on the stock plan and was called the Lake Navigation Company. It originated at Buffalo, and in addition to the vessels put in for stock a large number of vessels were bought. The trust owned its own tugs and was in a fair way of monopolizing the entire lake business. Dissatisfaction arose over some vessels being laid up and other troubles came, so that the combination lasted only a month or two.

What America Cost.

The discovery of America 400 years ago was not nearly so costly an undertaking as is the celebration of the event now. Some one has figured the expense of the provisions, stores, guns, carried by Columbus, with the salaries paid to himself and crew, and the sum is ridiculously small. Altogether it amounts to only $7,500. Columbus had naturally the highest salary of any one in the expedition, but figured in modern money it was only $320 a year. The captains of each ship received $192 each, and the surgeon only $38.25, while the seamen shipped for less than $30 per year. The purchasing power of money was greater in those days than now—especially of labor.

Subscribers will avoid danger of mistakes by giving the old as well as the new address when a change is desired.

Iron Mining Matters.

If the creditors of the Chapin Mining Company—into whose hands the big Chapin property has fallen, could secure from the Menominee Transportation Company, or members of the firm of M. A. Hanna & Co. who control the transportation company, a marked reduction in the price at which Chapin ore is to be carried by lake for some time to come under a ten year contract, it is more than probable that active mining operations would be resumed at the mines shortly. The Marine bank of Milwaukee, which holds a control of the Chapin stock, will shortly resume business in a regular way, and will, of course, seek to operate the mine at a profit. In this the bankers will very probably be assisted by reduced rail freight charges from the railway companies that derive a large profit from carrying Chapin ore to shipping ports, as these railways are also creditors of the mining company, and with so much accomplished toward operating the mine, it would not be surprising to hear shortly of a settlement with the owners of the vessels that were built to be a part of the Chapin combination.

Shipments of iron ore from Two Harbors up to and including Wednesday, Nov. 15, aggregated 892,234 gross tons and were divided as follows: Chandler, 430,214 tons; Minnesota, 364,536; Zenith, 12,998; Cincinnati, 9,939; Canton, 24,412; Franklin, 46,608; Hale, 3,510. Shipments of Gogebic range mines through Ashland up to Nov. 9th, when the season closed, foot up 1,117,520 tons, divided among the different mines as follows: Ashland, 41,016 tons; Aurora, 179,028; Colby No. 2, 57,702; Tilden, 135,118; Germania, 6,582; Iron Belt, 23,975; Montreal, south vein, 2,606; Montreal, north vein, 31,462; Eureka, A, 1,949; Germania, "Smith," 1,381; Brotherton, 16,193; Comet, 9,603; Eureka, 29,435; Careys, 28,558; Newport, 109,718; Norrie, 228,476; East Norrie, 78,135; Palms, 2,657; Pabst, 91,891; Jack Pot, 1,651; Davis, 13,282; Sunday Lake, 20,913; Odanah, 3,956; Windsor, 2,238.

The announcement that the Iron King and Wyoming properties of the Missabe range have been purchased by the Minnesota Iron Company is confirmed by the Cleveland officers of that company. It is expected that these mines will be full-fledged steel shovel mines. The prices named, $240,000 for the Iron King and $160,000 for the Wyoming, are approximately correct. No attention is paid in Cleveland iron mining circles to the report of a consolidation between the Minnesota Iron Company and the Rockefeller syndicate.

The port of Ashland closes the season with shipments aggregating 1,117,520 gross tons against 2,227,407 gross tons last year. The shipments from this port in previous years were: 1891, 1,253,493 tons; 1890, 2,174 556, 1889, 1,584,802, 1888, 1,016,414; 1887, 1,040,730; 1886, 721,984; 1885, 191,412.

Correct Figures on Missabe Range Shipments.

Shipments of iron ore from the Missabe range are practically at an end, and the agregate to Monday last, Nov. 20, as derived from reports made by Cleveland sale agents, is 582,026 gross tons, divided among the different mines as follows: Biwabik 148,235 tons, Missabe Mountain 122,563, Mountain Iron 110,000, Cincinnati 9,939, Canton 24,412, Hale 3,510, Franklin 46,608, Duluth 37,255, Commodore 65,116, Minnewas 12,749, Lowmore 1,635.

To Avoid Collision.

The Maritime Register of New York suggests that while the Navy department is making experiments to determine what color of paint is best suited to secure torpedo boats from detection by the enemy, it would be a good idea to ascertain what color of paint would be most conspicuous. This conspicuous color could be used for merchant vessels, and thus being more readily seen, collisions might then become less frequent. The experiments so far show that white is the color most readily detected, especially at night. This color may be more expensive for merchant vessels, and expense in these times has to be much considered, but anything that will lessen the dangers of collisions should also be taken into account.

A British chart of Lake Superior taking in the entire lake and giving detail regarding the north shore that is not to be found on United States charts, can be had from the Marine Review for $1.

Miscellaneous Mention.

At Milwaukee, Wednesday, the steamer Fountain City was sold to G. B. Hathaway for $4,976. The sale will yield the claimant about 35 cents on the dollar.

Col. William Ludlow, U. S. A., leaves Detroit this week for the east and will sail for London about Dec. 12, to take up his new detail as military attache of the United States legation.

Labor Inspector De Carry of Buffalo has deported across the border and back into Canada George H. Stover, a watchman on the steamer William Edwards. De Barry learned that Stover is an alien whose home is at Sombra, Ont. The captain is said to have made a contract with Stover at Marine City, when the vessel was bound from Buffalo to Chicago, to work for him at $30 a month, and on the return trip picked him up from a yawl off Marine City.—Coast Seamen's Journal.

Commander Nicoll Ludlow who was credited with very efficient service while acting as light-house inspector at Chicago, seems to have fallen in for most important naval duties since going to the Pacific. Among the latest news connected with affairs at Honolulu, is the announcement that the United States ships Mohican and Ranger have been ordered to Honolulu to relieve the Philadelphia, the Mohican, which is in charge of Commander Ludlow, to be made the flag-ship of the Pacific squadron.

Considerable attention has been attracted by what is termed the novel lengthening of two Narth German Lloyd steamers, the Sachsem and the Bayern, at the yard of Blohm & Voss, Hamburg, Germany. The article states that the usual method is to add to the stern, but that a new departure was taken in the case of these steamers, they being cut in two forward of the engine room and the forward end having been drawn away the required distance, the vacancy being filled by keel, plates, etc. The Spokane was lengthened about 60 feet last winter in exactly the same way at the Cleveland Ship Building Company's yard. It is not improbable that the Germans got their idea from the lakes, as the article speaks of one other case in history.

Statistics of disasters in all parts of the world during the month of September have just been published by the Bureau Veritas. Of the sailing vessels reported lost, twenty-five were American, one Brazilian, twenty-one British, two Danish, two Dutch, three French, five German, one Hawaian, four Italian, twenty Norwegian, one Portuguese, one Russian, four Swedish; total, ninety. In this number are included four vessels reported missing. Of the steamers reported lost, ten were British, one Danish, one French, one Norwegian, one Swedish; total, fourteen. Causes to which losses of sailing vessels were attributed are: Stranding forty-one, collision three, fire three, foundered eighteen, abandoned six, condemned fifteen, missing four. Causes for losses of steamers are: Stranding nine, collission two, fire two, foundered one.

An eastern exchange describes an engine for a vessel 78 feet long by 9 feet 6 inches wide, all parts of which are made as light as possible. It is a quadruple expansion engine, and the four cylinders have diameters of 9½, 13½, 18, and 24 inches respectively, by a stroke of piston of 10 inches. The engine rests upon a base having the form of a St. Andrew's cross. In order to make them as light as possible, the engines are devoid of all useless material. The parts of the engine are very light and are only of sufficient strength to resist the strains developed. The piston and connecting rods are hollow and the axle of the crank is turned in all accessible parts by machine tools, so that its original weight of 1,980 pounds is reduced to 414 pounds. The motor occupies a floor space of only 14 square feet, and weighs altogether 3,586 pounds. With a steam pressure of 256 pounds per square inch, and making from 500 to 600 revolutions per minute, the engine develops 500 horse power, so that the proportion of weight per horse power is as 7.15 to 1. Steam is generated in a multitublar boiler.

The masonry for the new lock of the new Sault canal was completed Nov. 10. The amount was 80,000 cubic yards, and the contract was for $1,000,000. The gates for the lock are under contract to be in place by the close of navigation next fall, and General Poe expects the new canal will be wholly completed by the spring of 1896. The Canadians have also just completed the masonry of the lock for their new canal on the other side of the river. They expect to have their canal ready for the passage of vessels by July 1 next. The lock of their canal is 900 feet long and 60 feet wide, while the lock of the new American canal is 800 feet long and 100 feet wide.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580 50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

ALTHOUGH the question of the removal of the tariff on iron ore is of as much importance to the vessel owners of the lakes as it is to the mine owners of the Lake Superior region, the vessel owners have failed in the past to take an active interest in legislation pertaining to the tariff. The season now drawing to a close has, however, served as a great object lesson to them. While the whole country has been disturbed by the efforts of the representatives of silver mining states in Washington to secure a continuance of protection for the silver industry, the mine owners and miners of Michigan, Wisconsin and Minnesota have suffered in silence a much heavier blow than that which created all the talk in the Senate, and the vessel owners, whose interests are the same as those of the mines, are about to close a season of heavy losses, because of depression in the one great industry of the lakes, the iron ore traffic. Grain, coal, lumber and all other leading commodities will show increases in the traffic statements for the season, but because of a falling of full 33⅓ per cent. in the iron ore movement the season's business as a whole is the most unprofitable for many years past. This is why the Lake Carriers' Association, an organization which has stood aloof from political questions and from any attempt to control carrying charges, has now taken up the matter of urging upon Congress the necessity of leaving in force the duty of 75 cents a ton on iron ore or, at least making only a moderate reduction in this duty, instead of removing it entirely as it is declared the ways and means committee intends to do. All the arguments advanced by representative associations in the iron industry against placing iron ore on the free list apply with equal force in considering the interests of lake shipping. There is, of course, no intention of claiming that the iron ores of Cuba, or any foreign mining district shipping to the Atlantic seaboard, will come into direct competition with Lake Superior ores in Pittsburg, the Mahoning valley or Chicago, but there is no question of the disadvantages that Lake Superior ores would sustain through indirect competition from the products of foreign ores in these districts, and from the foreign ores themselves in the territory east of the Alleghanies, where Lake Superior producers have found a profitable market during several years past. The influence of lake vessel owners has been felt in Washington on many occasions in the past, and it is to be hoped that their efforts in this regard will not prove fruitless.

OWNERS and officers of the steamers Philadelphia and Albany claim that the life boats of these steamers were in good condition, and it is not the intention to doubt their statements, but too much stress can not be laid upon the importance of thorough and frequent examinations of life saving appliances by ships' officers, aside from that made by the officers of the steamboat inspection service. And how unfortunate it is, also, that there is no government supervision of life saving appliances on sailing vessels. Many an old vessel master has been heard to claim that in a good yawl boat he would feel safer in a storm than he would on a vessel that gave any signs of taking water under him, but it must be admitted that the yawl boats of today are not what they were some years ago. Especially is this the case with the small boats on some powerful steamers, where confidence in the ability of such steamers to withstand almost any kind of weather, often causes officers to neglect the watchfulness that is always necessary regarding life saving appliances. Then too, competition among builders of these small boats, and in some cases a demand from the ship builders for reduced prices on the boats has resulted in mere shells, taking the places of what were formerly strong yawls. Very often the captain who may want a very good life boat can not dictate to the ship builder, whose desire to reduce cost of equipment is too often of first importance to him, and cases have been noted where the influence of ship builders has caused government inspectors to be backward in enforcing the full requirements of the law with reference to life saving appliances on new ships. Altogether this question of strong sea-worthy life boats should at all times be foremost in the minds of everybody interested.

PROBABLY not twenty-five persons connected with lake shipping had ever read, before the beginning of criminal proceedings against certain members of the crew of the lost steamer Nevada, of the law that attaches the death penalty to the crime of casting off a vessel. It has been well suggested that the law should be modified so as to make the penalty less severe in cases where no loss of life is involved, on account of the difficulty of conviction when death is to follow, but aside from the feature of news referred to and the proposed modification of the law, there is probably little of importance in the Nevada case. As the boat was heavily mortgaged and as a large part of the insurance went to the holders of the mortgage and to other creditors, it is not probable that the owners would go to such an extreme as that of casting off their vessel in order to realize the small portion of insurance that reverted to them. Furthermore, he would be an odd master who would let his engineer, mate and other members of his crew into such a secret. If the captain of the Nevada wanted to lose his vessel he could readily put her onto the rocks or otherwise wreck her without going to the engineer to open the sea-cock.

Secretary Herbert has reached that part in the preparation of his annual report in which the important question of additional ships to be asked for from Congress must be decided. He is now in consultation with the bureau chiefs on this subject. His disposition is to recommend two additional battle ships and a liberal number of torpedo boats.

Although the Albany and Philadelphia lie in 200 or more feet of water off Point au Barques, we will send you good photographs of both of them for $2. Address the MARINE REVIEW, 516 Perry-Payne building, Cleveland, O.

Form and Speed of Ships.

Dr. Francis Elgar, famous among British naval architects, is thus quoted in a report of a recent meeting of the British Institution of Naval Architects.

"The full effect of form upon average speed at sea, over long voyages and in all weathers, can not be measured by still-water trials. The form that gives the best results in still-water trials, with any size of ship, does not necessarily give the best results at sea. It is sometimes said as an objection to model experiments, such as Mr. Froude taught us to make, and to still water trials—which belong to the same category—that they do not tell us what the speed will be at sea, or what is the best form for speed at sea. The reply is that Mr. Froude never said they would. The late Mr. Froude always explained that his experiments merely related to speed in absolutely smooth water; and R. E. Froude reminded 'The Institution' in 1883 that his father was very particular in pointing out this qualification. He said in speaking of the comparative resistance of long and short ships: 'A diminution of the fulness of the ends, and concentrating the displacement in the middle of the ship, and removing it from the ends, is certainly likely to make the ship pitch; and it is not only objectionable on that ground, but the performance of such a ship in a seaway would, from that reason, be comparatively less favorable than in still water, because the pitching must certainly rather tend to increase the resistance. So that it is probable the gain in the performance which we find in trials to be realized by ships with fine ends in still water is greater than they would evince in practically working at sea.'

"If it ever be assumed that the best form of ship for a still-water speed trial is the best form for speed at sea, as herein defined, or that the sea speeds will bear a fixed relation to the trial speeds, Mr. Froude must not be blamed for the fallacy. Mr. Froude has given us a wonderfully ready and exact means of determining the resistance of ships in smooth water, but the designer is necessarily left to his own judgment and experience as to the modifying effects of bad weather and heavy seas, which are all-important upon such voyages as Atlantic steamers are designed for. I have crossed the Atlantic seven times, but it has never been my lot to find there a state of sea which even approximately resembled the conditions of a still-water trial. With fine lines forward and aft, such as would be most favorable to trial speeds, the speeds at sea might be considerably reduced; and it would be easy to improve the speed upon trial of some of the fast Atlantic steamers at the expense of their subsequent speeds at sea. The improvement of existing forms in suitability for Atlantic seas must, in my judgment, be looked for more in knowledge and experience of what such a sea requires than in mere still-water experiments. Some of the present steamers maintain an average speed of not more than a knot less than they obtained on trial with the same power, showing that their forms are almost as well adapted for speed in ordinary seas as in smooth water; and it would be easy, as I have said, if speed upon smooth-water trials were the crucial test, to considerably increase the latter at the expense of the former.

"One of the chief points in connection with the form best adapted for sea speed is that it should offer resistance to pitching. The fineness of ends that would give the best results in smooth water requires to be corrected by the fullness necessary to prevent undue pitching. It is only the judgment and experience of the naval architect that can decide where the line is to be drawn between the two directions. If he err on the side of fineness, as tempted, perhaps, by the desire to obtain the highest possible still-water results, he will lose in speed where there is any sea; and if on the side of fullness, he will lose by excess of resistance in smooth water, and perhaps at all times. R. E. Froude has pointed out in the passage already quoted that pitching tends to increase resistance; but there is in addition the further consideration that it practically limits speed in a heavy sea. The engines require to be slowed as soon as a ship pitches so as to take heavy water on board or to lift the propellers sufficiently out of the water to cause racing; and it is the ship that moves easily over the seas without requiring the engines to be slowed on account of pitching that makes the best passages in bad weather. Circumstances which thus influence, and often limit, speed at sea are not taken into account in still-water experiments, and I doubt if it would be possible to arrange to do so in a way that would be satisfactory in any experiments with models."

From the Chief Naval Constructor.

Another plea for an experimental tank for progressive speed trials is made in the annual report of Philip Hichborn, chief constructor, U. S. N. "The United States is now the only great maritime country," he says, "which does not possess an experimental tank, the Russians having remedied during the past year their deficiency in this respect. The valuable data to be obtained by experiment with models in a properly equipped tank would soon repay the original outlay necessitated by its installation."

At the beginning of the administration of Chief Wilson, Mr. Hichborn's predecessor in the bureau of construction and repair, the navy consisted of a comparatively small number of obsolete wooden steam and sailing vessels and a half dozen small iron gunboats. Since that time there have been added to the navy forty-five vessels, aggregating 173,000 tons displacement, and costing for hulls and machinery alone more than $52,000,000. These vessels embrace almost every variety of type of modern vessels of war, and the excellence of their design and construction has been the subject of most pronounced commendation by naval architects who stand at the head of their profession in the principal maritime countries of Europe.

In General.

The American Shipbuilder says there is a prospect that the Bath Iron Works of Bath, Me., will soon begin the construction of a large four-masted steel schooner for San Francisco parties.

Mr. Geo. Uhler, president of the Marine Engineer's Beneficial Association and formerly chief engineer of the Morgan line, will be married this month to Miss Clara May, of Philadelphia.

The most singular ship in the world is the Polyphemus of the British navy. It is simply a long steel tube, deeply buried in the water, deck rising only four feet above the sea. It carries no masts or sails, and is used as a ram and torpedo boat.

A board consisting of Commodore W. S. Schley, U. S. N., Captain G. F. Wilde, U. S. N., and Superintending Engineer W. T. Sylven of the light-house service has been ordered by the treasury department to make steaming and economy tests with different kinds of boilers.

The arrival of the largest wooden sailing craft afloat under this or any other flag, the clipper ship Roanoke, at New York recently 111 days from San Francisco is noted. The Roanoke measures 3,400 tons gross, is 335 feet long, 49 feet beam and 29 feet deep, and carries a spread of 20,000 square yards of canvas.

Although officers of the revenue marine service have begun work on plans for the two revenue cutters—one for the lakes and the other for the New England coast—authorized by the last congress, the contracts can not be let until money for their construction is secured in the civil sundry appropriation bill, to be passed by the next congress.

If a sleepy engineer runs into a train and kills and cripples a lot of people, and he escapes unhurt, he is put upon another engine, says the Louisville Courier-Journal. If a pilot on a steamboat shuts his eyes, runs over a coon in a canoe and ducks him and drowns his dog, Uncle Sam takes the pilot's license away from him and starves his family for six months or a year.

The new steamer Gloucester, built at Baltimore for the Merchants' & Miners' Transportation Company and which made her first trip to Boston a few days ago, is probably one of the finest coasting vessels afloat. The hull is built of steel throughout, and she has four decks as well as a promenade deck. Her length over all is 293 feet, beam 43 feet, depth 33⅓ feet, and tonnage 2,500. Power is furnished by direct tri-compound engines with inverted cylinders, and the four cylindrical and return tubular boilers are capable of developing 3,000 horse power.

The ponderous after barbette of the United States battle ship Indiana, buildidg at Cramp's yard, was put in place last week. It is composed of the heaviest nickel steel armor ever fitted, and has been in course of construction at Bethlehem for nearly two years, the work of putting it in place occupying two months. The barbette is made in thirteen plates, which were forged under the 125-ton hammer. It is 30 feet in diameter, 13 feet high and 17 inches thick, the total weight being 406 tons. The Indiana will, it is calculated, be ready for her builders' trial by Feb. 1, and the vessel will be delivered to the government about June 1.

Around the Lakes.

The United States engineer has been provided with the tug Spear for inspection and other work. She was sold to the government by Port Huron parties.

The barge Church tried to go through the maze between the port of Toledo and Lake Erie without a tug and two tugs worked nearly a week to get her back into the water again. The tug Day rolled herself over in this alleged straight channel some timo ago, and just returned to Conneaut this week. Col. Smith, the government engineer, is going to inspect the channel soon.

Two plans for the enlargement of Buffalo harbor will be considered by the committee on river and harbors. One is that the new breakwater extension shall commence about 500 feet inside the outer end of the present breakwater and run to a point about a half mile nearer Buffalo than Stony point. The other plan is to begin the extension 200 feet outside the outer end of the present breakwater and extend in a straight line to Stony point.

Lake Erie fishermen seem to be between the devil and the deep sea lately. A Cleveland fisherman was prohibited from bringing fish from Canada without paying the duty, a revenue cutter being employed to watch his tugs, and later he was charged by the state game warden with fishing out of season. Tais week the Dominion government seized the tug Oggles of Sandusky for fishing in Canadian waters. The crew was released but the tug is still in the hands of the Canadian custom officers.

Dimensions of the Ark.

Speaking of ancient ships and shipbuilding, Prof. J. Harvey Biles said that though Great Britain and America had made such great strides in shipbuilding, none of their wooden ships approached the dimensions of the Ark, which was 450 feet long, 75 feet broad, and 45 feet deep. He calculated that this was the size of this vessel from the Bible measurements, taking the cubit to be 18 inches. This, he thought, was the correct measurement. The largest wooden ship afloat now did not nearly approach the size of the Ark; the vessel was the Shenadoah, and her dimensions were 299 feet by 49 feet broad and 29 feet deep. Even the Campania was much smaller than the Ark, except in length, and the dimensions of the Ark had only been exceeded in the case of the Great Eastern. In 1856 a prize was offered for the best model of a ship made by anyone in the United Kingdom and the models were on view at the Royal Institution. The prize was awarded to a model six times the beam to the length, and ten times of depth to the length, these being the same proportions as those of the Ark.

Trade Notes.

The tug L. L. Lyman was equipped some time ago with the Sheriffs Manufacturing Company's steam steerer, and it has proven so satisfactory that Capt. Inman will equip the entire fleet.

The Sound steamer City ot Lowell, illustrated in the last issue of the REVIEW, is building under the highest class in the Standard Register, published from the Post building, 16 and 18 Exchange place, New York, N. Y.

The American Shipmasters' Association, New York, N. Y. classed the following vessels last week. Screw steamers Algiers and New York, schooner Andrew Jackson, barkentine D. A. Brayton, half brig David Bugber, bark Emma T. Crowell and three masted schooner Fred Jackson, all American.

The Southern Pacific Railroad Company will build a new cotton shed at New Orleans, 120 feet wide and 250 feet long. They have placed the contract with the Berlin Iron Bridge Company of East Berlin, Conn. The building will be entirely of iron, the sides being made with the Wilson patent rolling shutters.

The assignee of the Linden Steel Company has been discharged by order of court, and the plant is now in operation. The assignment was made necessary to avoid attachment of foreign accounts while an extension was being arranged, which has been satisfactorily done. How full the works will run will depend on the condition of trade. At present only the blooming mill, one ten-inch mill, hammers and sheet mill making Linden patent steel floor plate are running.

The Worthington pump manufacturers are quite busy at present with the Brazil fleet. They are putting in a complete set of pumps to take the place of the British pumps on the Britannia, and supplying El Cid with spare parts of pumps that may be needed, as she doubtless leaves the country for good. Last Monday the Worthington company took a contract to build two pumps of 3,000 pounds pressure, and have them in place by Thursday on the Brazil craft Fieseen or forfeit $10 per hour if not ready on time. It is hardly necessary to state that the pumps were in place and the $10 per hour clause did not count. The Nada, another of the Brazil fleet, is also being furnished with the Worthington pumps, in place of others.—Marine Journal, New York.

Another C. & O. Steamer.

On Saturday last week the Chickahominy went on her trial-trip off the Hartlepool coast prior to making her maiden voyage across the Atlantic. She is the second of the three steamers built at West Hartlepool, by Furness Withy & Co., Limited, for the Chesapeake & Ohio Steamship Company, and is fit not only for general cargo, but especially for the carriage of live cattle from this country to Europe. The vessel is provided with main engines and boilers from the Central Marine Engine Works, West Hartlepool, the cylinders being 28 inches, 43½ inches, 72 inches by 48 inches. The boilers are two large double-ended boilers working at 160 pounds per square inch, made on the plan universally adopted at the Central Engine Works with welded and flanged shell plates. The engines are of the well-known opened-fronted type produced at these works, and on the trial-trip they were handled ahead and astern with the greatest facility. The trial-trip took place in unfavorable weather, there being a heavy sea running and much wind, which prevented anything like a test being made of the speed of the vessel. The engines, however, ran in a highly satisfactory manner, and to the entire approval of those on board.—Fair Play.

Marine Wonders.

One of the marine wonders of the world is the great barrier reef of Australia. This stupendous rampart of coral, stretches in an almost unbroken line for 1,250 miles along the northeastern coast of Australia. Nowhere is the action of the little marine insect, which builds up with untiring industry those monuments with which the tropical seas are studded, more impressive. By a simple process of accretion there has been reared in the course of countless centuries an adamantine wall against which the billows of the Pacific sweeping along in an uninterrupted course of several thousand miles, dash themselves in uninterupted fury. Inclosed within the range of its protecting arms is a calm inland sea, 80,000 square miles in extent, dotted with a multitude of coral islets and presenting at every turn objects of interest.—Seaboard.

After four tests with differect lights in the light-house at Cap de la Heve, near Havre, it is believed that the French government has the most powerful coast light in the world. The use of the electric arc light is combined with a lenticular flashing apparatus, yielding 24,000,000 candle-power, and capable of being seen on a clear night no less than 130 miles distant. A new light has, however, been practically completed and this will have a luminous intensity of 40,000,000 candle-power, and will always be visible at least 23 miles.

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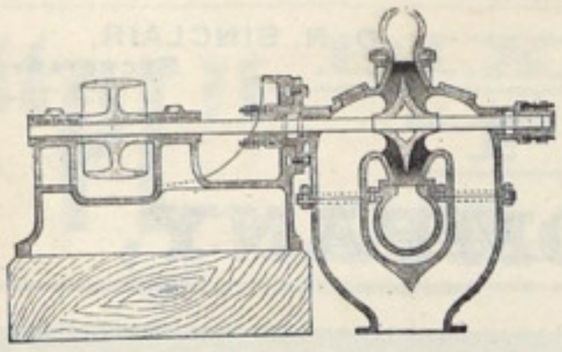

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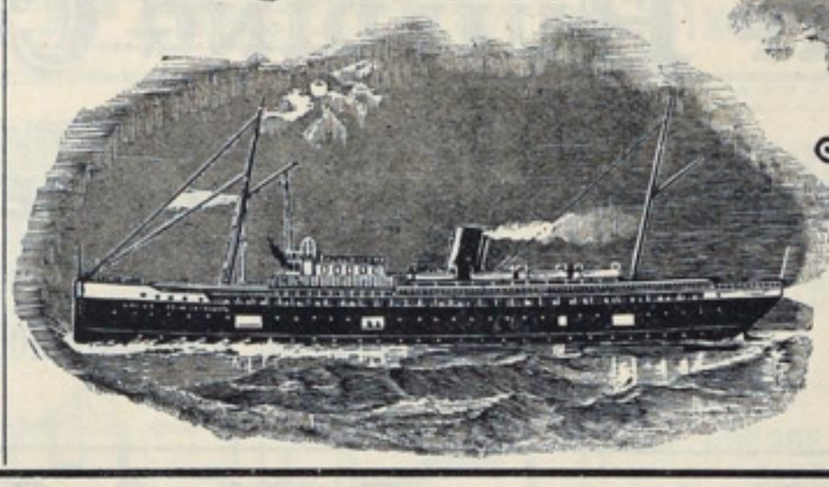

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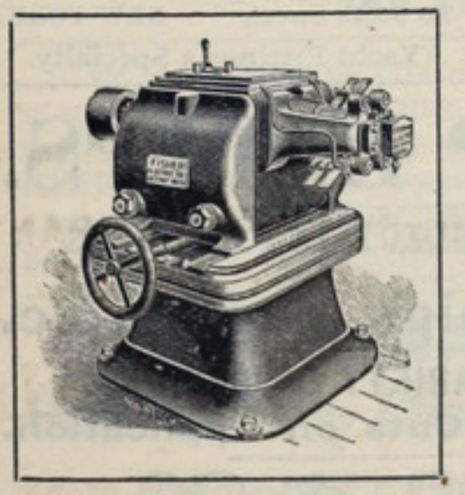

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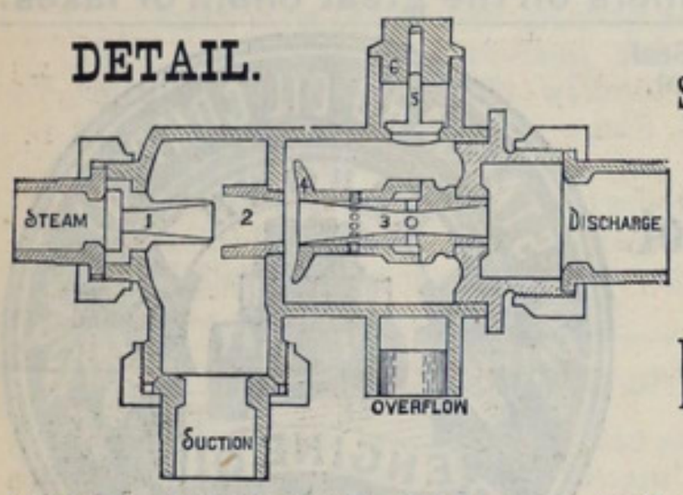

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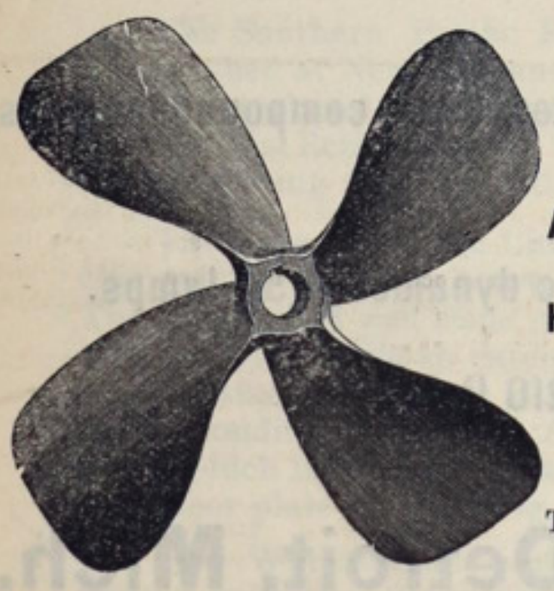

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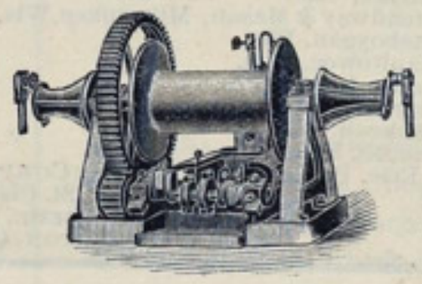

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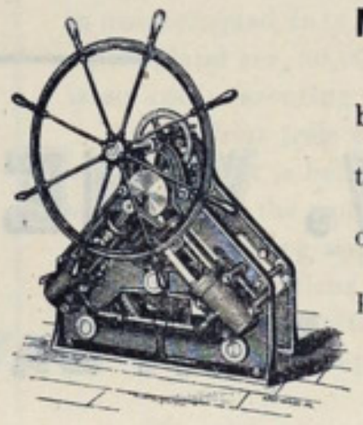

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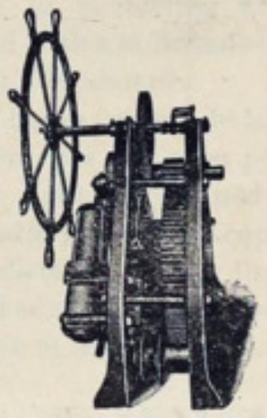

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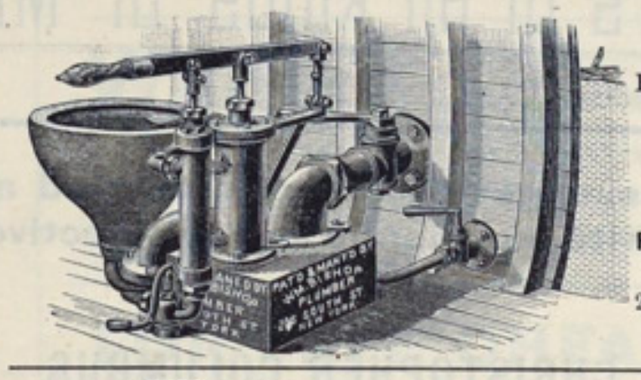

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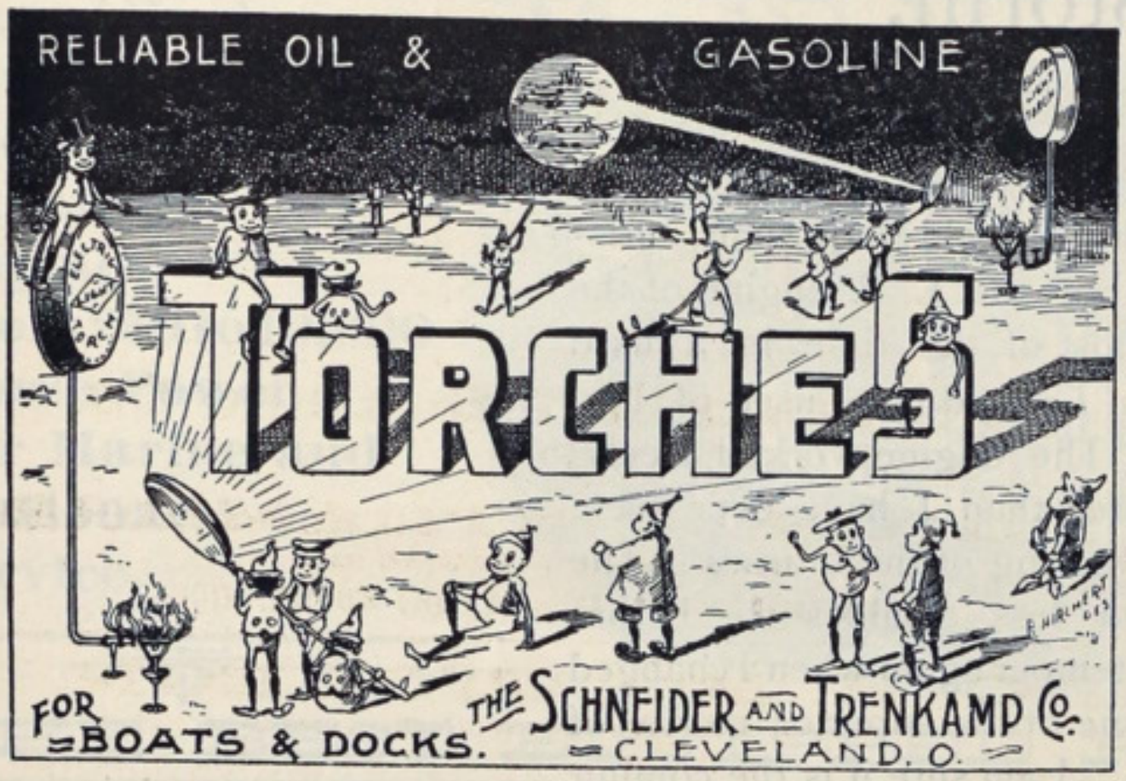

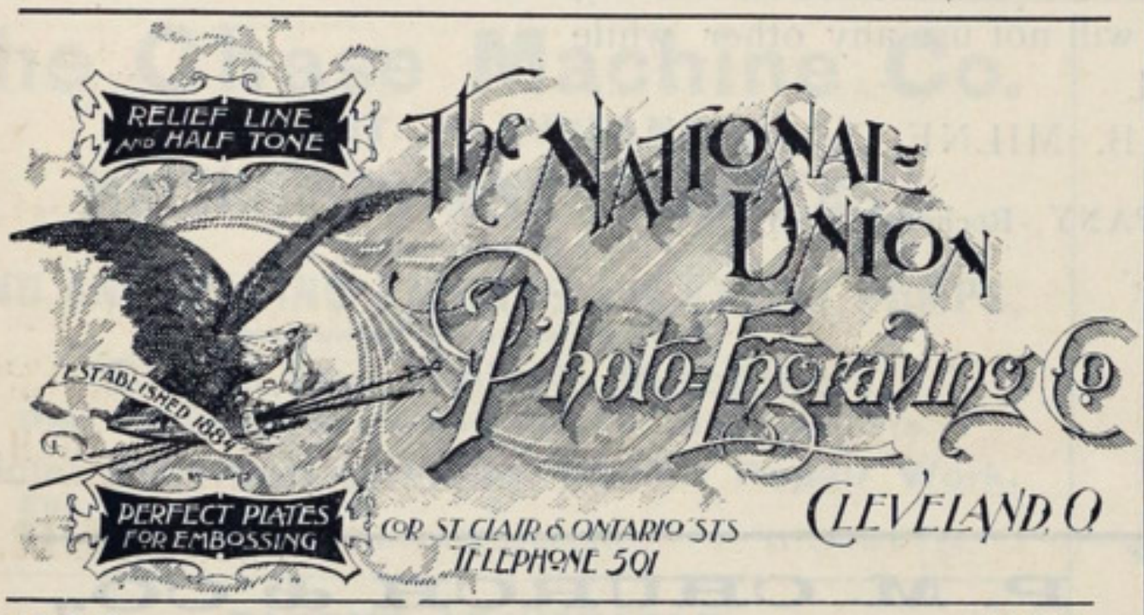

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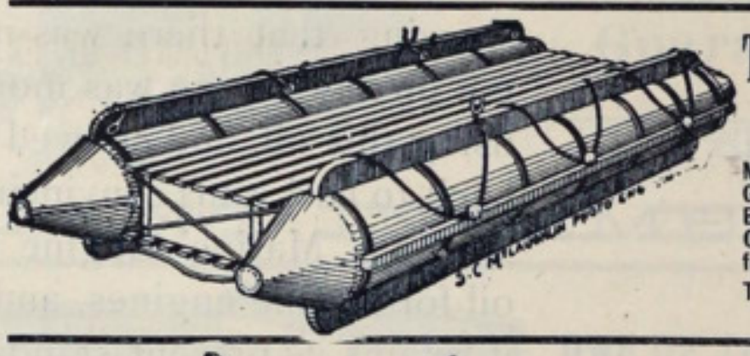

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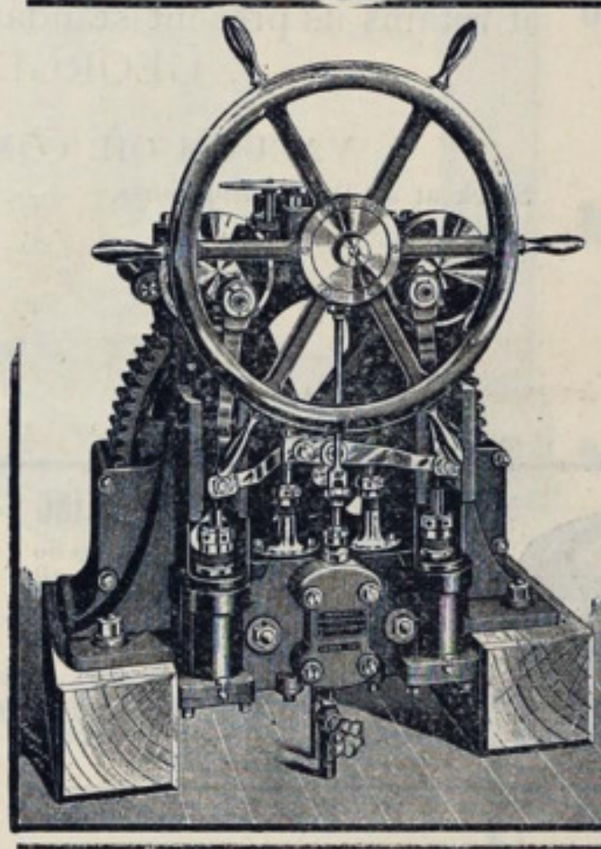

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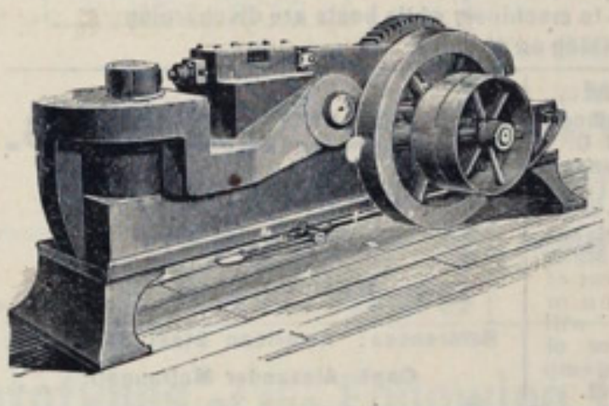

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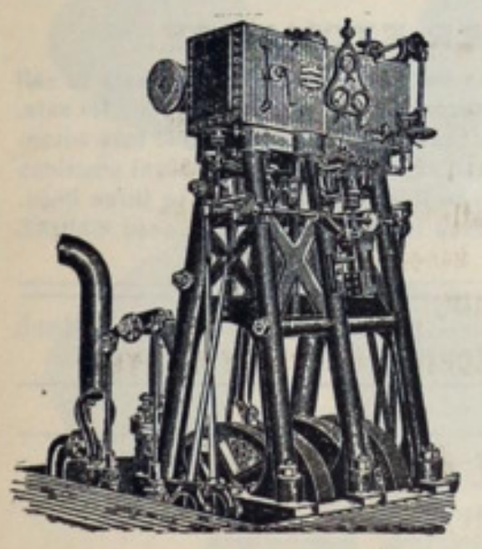

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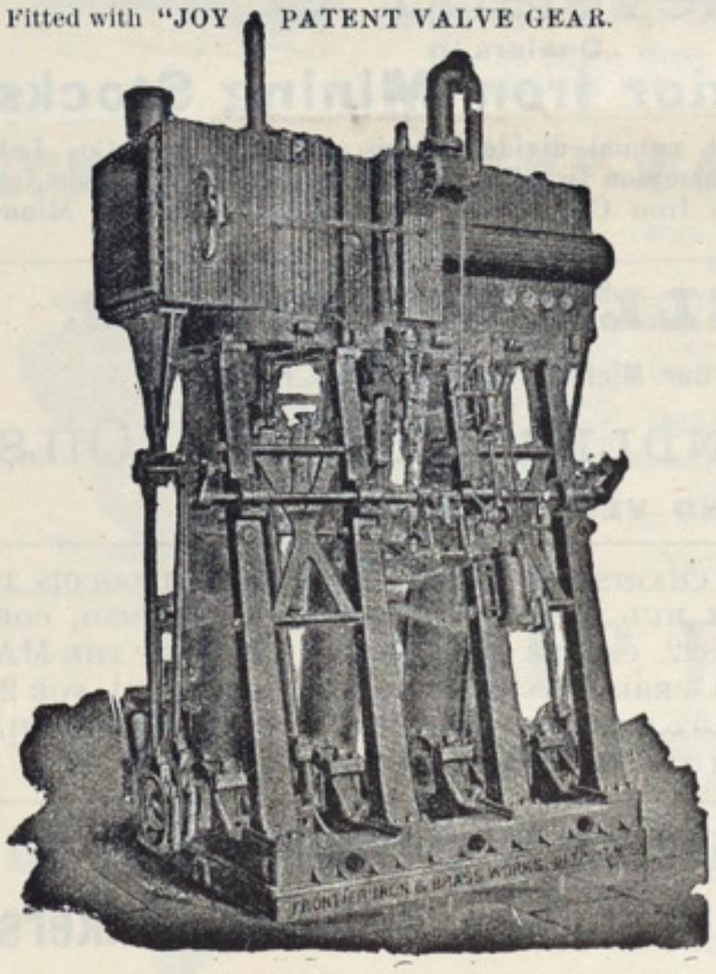

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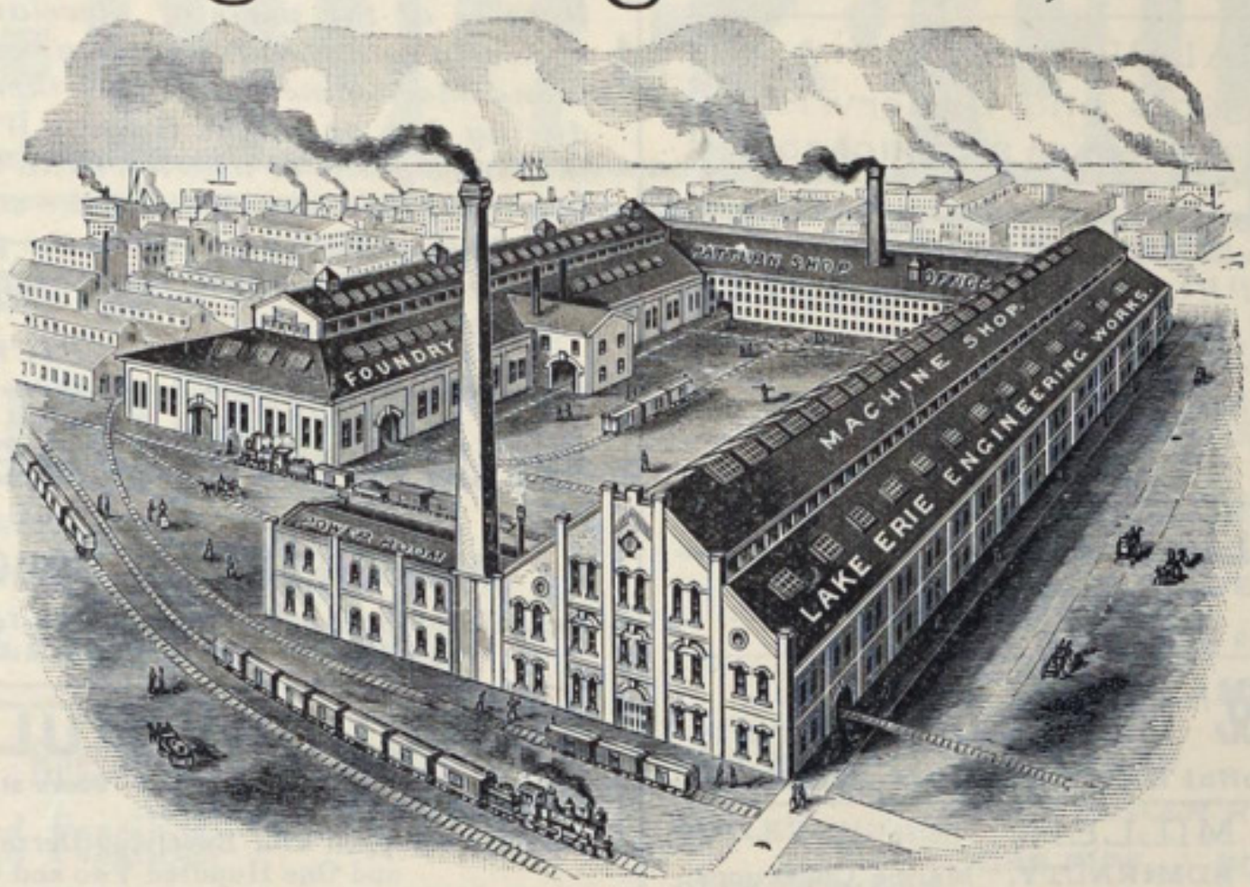

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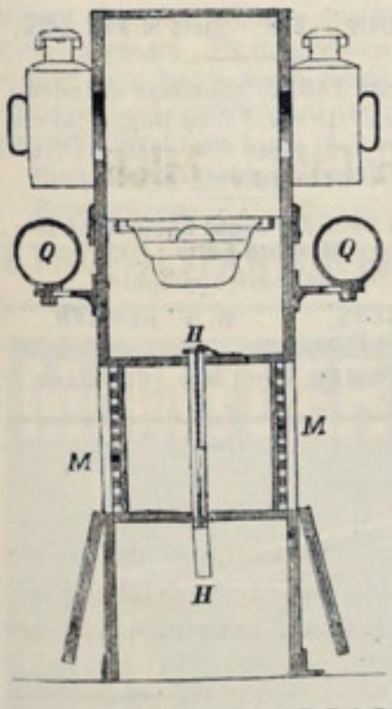

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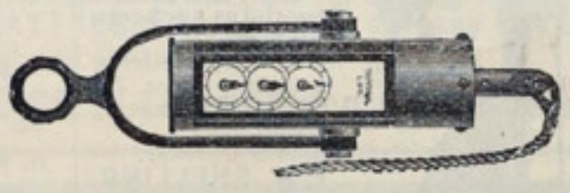

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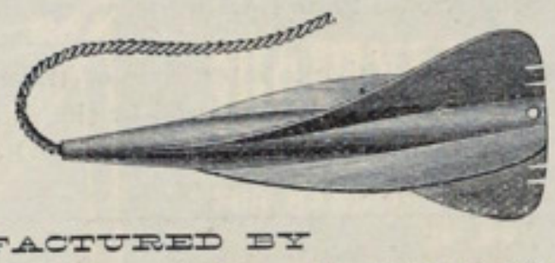

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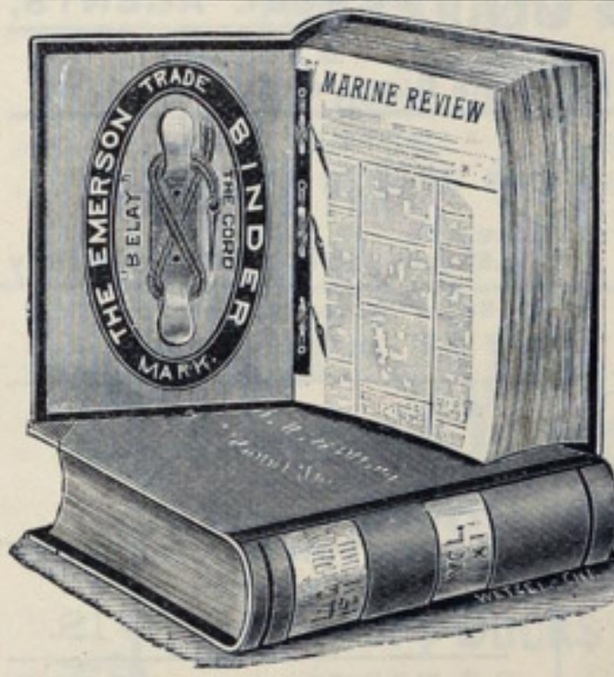

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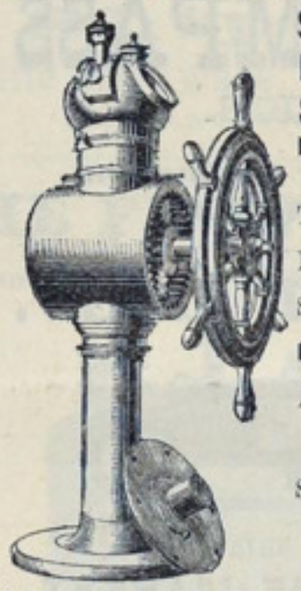

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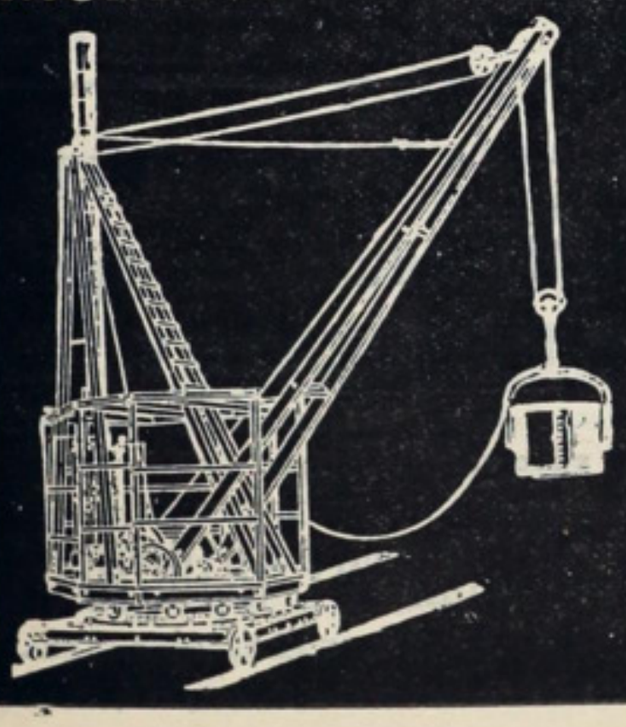

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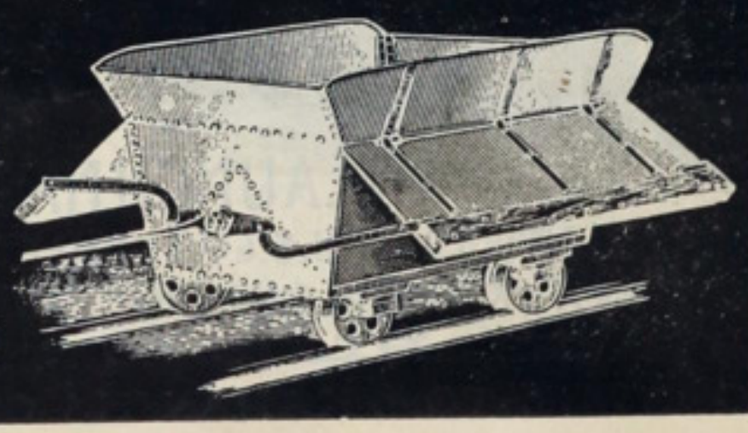

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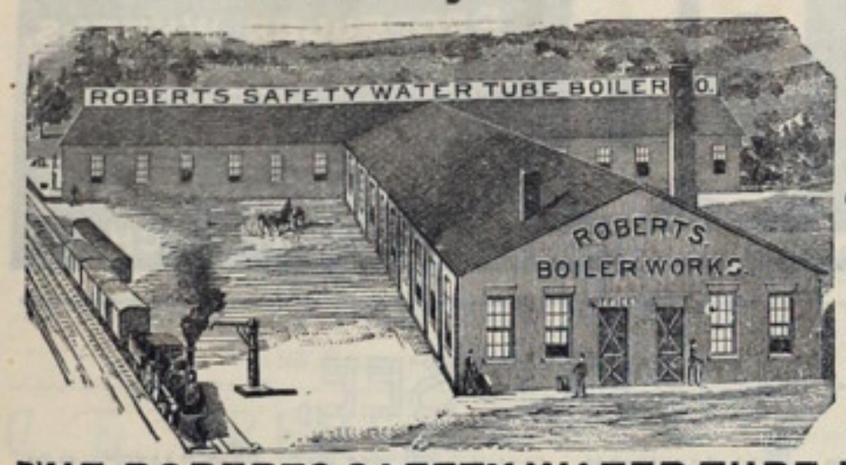

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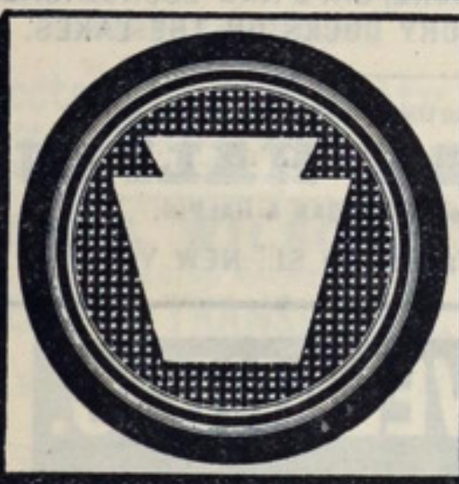

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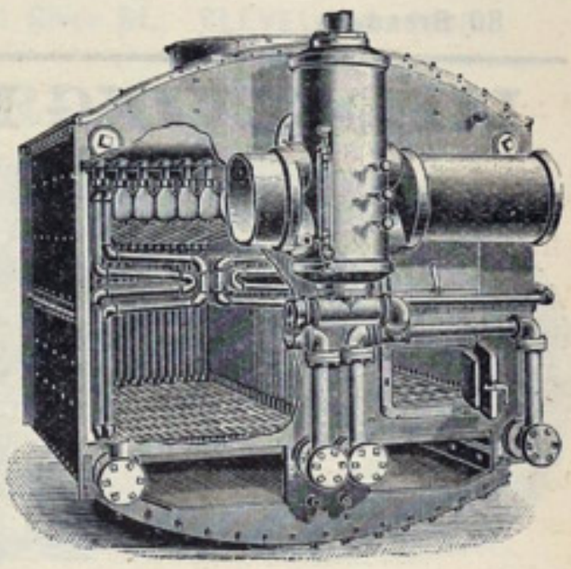

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